

REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the thorough review of the present application. Based upon the amendments and the following remarks, Applicants respectfully request reconsideration of the present application and allowance of the pending claims.

35 U.S.C. § 103 (a) Rejections

Claims 37 and 40 stand rejected under U.S.C. 103 (a) as being unpatentable over Chu et al. in view of Kraemer et al. In light of the following remarks, the rejection is respectfully traversed.

The Examiner admits that Chu et al. fails to disclose a multi-tasking operating system. The Examiner further admits that Chu et al. fails to disclose placing high priority on operations that adjust the setting of the imager. For both of these elements, the Examiner relies on Kraemer et al. Applicants respectfully submit that not only does Kraemer et al. fail to disclose an Operating System, it also fails to disclose placing higher priority on operations that adjust the setting of the imager (as opposed to the actual physical operation of exposure). Applicants further respectfully submit that the combination of Chu et al. and Kraemer et al. is impermissible in-so-much as: 1) the combination lacks motivation; and 2) Kraemer et al. is non-analogous art.

Chu et al. discloses a portable data collection system that operates much in the same manner as the prior art systems discussed in the present application. Specifically, a set of linear processes is disclosed with each process dedicated to a single function that feeds a subsequent process. Taking FIG. 2 as exemplarily, it can be seen that imaging data is transferred from gain circuitry 52 into a signal processing circuit 26. The signal processing circuit 26 calculates an intensity histogram value for a captured frame along with average values of “peaks” and “troughs” (I, DRMAX, and DRMIN) – see col. 9, line 58 et seq. The three values are submitted

to a fuzzy logic control unit 20. The signal processing circuit 26 and the fuzzy logic control unit 20 are both implemented in fuzzy logic image control circuitry 18. The fuzzy logic control unit 20 calculates an index modification value which is transmitted to exposure period circuitry 48 for use in setting exposure parameters (gain settings, exposure period, and high and low reference voltage values). This process is repeated (typically three times) until the difference between two subsequent index values is minimal. At that point, the captured frame is considered valid and is finally stored in a memory 19 for decoding using decoding circuitry 92.

Kraemer et al. is directed toward a microfilming system utilizing a microprocessor for controlling operation thereof. The CPU 50 operates, in effect, as a gate keeper to ensure that operations carried out by various pieces of hardware are performed in a correct order - "That is, the other elements of the system have certain control electronics, but the micro-processor originates the commands." see col. 5 lines 26-38. It appears to the applicant that the CPU 50 is hardwired to a operate in accordance with a single program, and as such there is no indication of an operating system much less of any multi-tasking OS.

For the Examiner's reference, the eighth edition of the **DICTIONARY OF COMPUTER AND INTERNET TERMS** published by Barron's provides the following definition for an Operating System:

"a program that controls a computer and makes it possible for users to enter and run their own programs..."

Similarly, the current (as of 2/24/2006) entry in Wikipedia for Operating System sets forth the following:

"Most current usage of the term "operating system" today, by both popular and professional sources, refers to all the software that is required in order for the user to manage the system and to run third-party application software for that system. That is, the common understanding includes not only the low-level "kernel" that interacts directly

with the hardware, but also libraries required by applications as well as basic programs to manipulate files and configure the system.”

The Examiner indicates that the mere existence of interrupts in Kraemer et al. dictates the presence of a multi-tasking OS. It is to be noted that Kraemer et al., teaches prioritization of interrupts by a separate priority interrupt device 110 located on an I/O unit 51. See col. 6 lines 16-31. It is to be further noted that priority is determined for services “**external** to the CPU 50.” see col. 6 line 16. Thus, the interrupts described in Kraemer et al. are not software based interrupts but are rather hardwired outside of the CPU and, as such, are not part of the programming of the CPU, much less any identifiable OS. Accordingly, Kraemer et al. does not disclose a multi-tasking operating system as is understood by those of ordinary skill in the art.

Also, contrary to the Examiner’s assertion, Kraemer et al. does not anticipate the division of labor as is claimed in the present invention. Claim 37 sets forth: “a plurality of concurrently executed software based imaging modules to calculate and adjust settings of the imager based on an analysis of the image signals stored in the memory component wherein modules that adjust setting of the imager are given a higher priority than modules that calculate desired settings of the imager.” The only priority that Kraemer et al. provides is giving the physical operation of exposure (i.e. opening and closing the shutter) the highest priority. In other words, if a requested operation would adversely affect a current exposure of a frame (such as advancing the film during an exposure), the requested operation is queued. The most that applicant can infer is that operations are either allowed to proceed or initiation is paused while another operation completes. There is no indication that the current execution of one process is suspended while another is carried out – the sine qua non of multi-tasking.

With respect to the claims at issue, there is no description of priority as between processes that calculate the exposure parameters and processes that set the parameters for the physical act of exposure. As noted above, many of the actual operations are performed by additional hardware modules. Of particular interest is the exposure control printed circuit board (PCB 54 and the exposure control module 59 (see FIG. 6). It appears that the exposure control

PCB 54 determines exposure parameters based on the output of a photosensor 58, while the exposure control module 59 sets the exposure parameters of the camera 26. see col. 7 lines 1-7. Although, claim 1 indicates that the microprocessor 50 exercises control of the camera based on the output of the exposure control. In any event it is quite clear that the determination of exposure settings is performed by dedicated hardware and not a process running on the CPU 50. It is unclear what if any priority is placed on the execution of processes on the exposure control module 59 versus the exposure control PCB 54.

Claim 37 and 40 describe a system in which a central processing unit operates in accordance with a multi-tasking operating system and a plurality of software based imaging modules to adjust settings of the imager based on an analysis of the image signals stored in the memory component wherein modules that adjust setting of the imager are given a higher priority than modules that calculate desired settings of the imager. Accordingly, Applicants submit that the proposed combination cited by the Examiner lacks at least the following elements:

- 1) a central processing unit operating in accordance with a multi-tasking operating system;
- 2) a plurality of concurrently executed software based imaging modules to calculate and adjust settings of the imager based on an analysis of the image signals stored in the memory component; and
- 3) modules that adjust setting of the imager are given a higher priority than modules that calculate desired settings of the imager.

In so much as the Examiner has failed to set forth a *prima facie* case of obviousness, withdrawal of the subject rejection is requested.

In addition, applicants object to the combination of Chu et al. with Kraemer et al. in that the required motivation to combine the references is lacking. Applicants also object to Kraemer et al. as being non-analogous art.

Karsten Mfg. Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1385 (Fed. Cir. 2001) states: "In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention."

In re Fine, 837 F.2d 1071, 1075 (Fed. Cir. 1988) states that there must be: "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references"

A review of Chu et al. and Kraemer et al. failed to uncover any motivation or suggestion for combining the control system of a micro-photocopying machine with that of a portable data collection system. Applicants note that the Examiner has not cited any motivation in the outstanding Office Action.

Applicants also submit that there is nothing in Kraemer et al. directed toward bar code readers, much less portable bar code readers. It is further noted that, the art of microfilming is outside any area of interest to those of ordinary skill in the art of bar code readers and as such would not be a technological area which would be referenced to solve problems with bar code readers or imagers.

For at least the foregoing reasons, withdrawal of the instant rejection is respectfully requested.

Claims 1-3, 7, 9, 10, 18, 19, 29-35, 38, 39, 41-47, and 49-53 stand rejected under U.S.C. 103 (a) as being unpatentable over Chu et al. and Kraemer et al. in view of Lewis.

In light of the following remarks, the rejection is respectfully traversed.

As noted above, the combination of Chu et al. and Kraemer et al. fail to disclose at least a multi-tasking operating system. The argument set forth above regarding the combination of Chu et al. and Kraemer et al. are to be considered restated herein. Lewis has been added for the concept of a second software-exclusive module. Applicants respectfully submit that this rejection should be withdrawn for failing to suggest the use of a multi-tasking operating system and as an impermissible combination for lacking motivation and encompassing non-analogous art.

Taking claim 1 as representative of the rejected claims, the following elements are not taught by the Examiner's combination of art:

a processor operating according to a multi-tasking operating system;

a histogram processing module executed by the multi-tasking operating system as a low priority task that analyzes the image data in the memory component and calculates a target contrast; and

an imager control module executed by the multi-tasking operating system as a high priority task that sets a gain and exposure for the imager based on the target contrast calculated by the histogram processing module.

Initially, applicant's note that Lewis discloses a system for use with an endoscope and as such is not analogous art to the present invention. Outside of the widely divergent use cases (looking inside a human body vs. scanning a bar code), the fundamental difference is that Lewis is directed toward displaying live video data on a screen as opposed to obtaining discrete images. While this may appear to be a subtle difference, it shows itself in a variety of ways. For example, the system diagrams of Lewis contain no separate memory component that is described

as storing the frames of data. Storing frames is simply not important in processing a live video feed. If storage is desired, a VCR or recordable DVD is typically attached in between the system and the display. The memory component 14a cited by the examiner is simply memory provided to the CPU 14 for the storage of software embodying the invention. As further evidence of the divergent nature of the present invention and Lewis, please note that one embodiment of Lewis utilizes analogue circuitry.

In any event, Lewis operates much in the same manner as the prior art systems discussed in the present application. With respect to the present claims, there is no suggestion in Lewis regarding the use of a multi-tasking operating system, as that term is understood by those of ordinary skill in the art, or of how to prioritize the various modules. Much like the Applicant's description of the prior art, Lewis pipe-lines the processing of image data from one module to the next. As such none of the prior art combined in the present rejection discloses individually or in combination:

- a processor operating according to a multi-tasking operating system;

- a histogram processing module executed by the multi-tasking operating system as a low priority task that analyzes the image data in the memory component and calculates a target contrast; and

- an imager control module executed by the multi-tasking operating system as a high priority task that sets a gain and exposure for the imager based on the target contrast calculated by the histogram processing module. See claim 1.

The remaining claims contain similar limitations, for example, claim 19 sets forth: "a processor operating pursuant to a multi-tasking operating system that executes a high priority software-exclusive module for real time control of the imager and a lower priority software-exclusive module that examines the image data and provides feedback to the high priority software-exclusive module facilitating setting of a gain and exposure of the imager."

Accordingly, withdrawal of the present rejection is respectfully requested.

Claims 14, 16 and 17 stand rejected under 35 U.S.C. 103 (a) as being unpatentable over the Chu et al. in view of Kraemer et al., Lewis and Feng. In light of the following remarks, the rejection is respectfully traversed.

Claims 14, 16, and 17 depend either directly or indirectly from claim 1 and share the limitations set forth therein. Feng does not cure the defects noted in Chu et al., Kraemer et al. or Lewis noted above. Accordingly, withdrawal of the present rejection is respectfully requested.

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Conclusion

In view of the proposed amended claims and the remarks submitted above, it is respectfully submitted that the present claims are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present invention.

In the event that extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 503577.

Respectfully submitted.

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